

Pre-K 3

A Question of Continuity

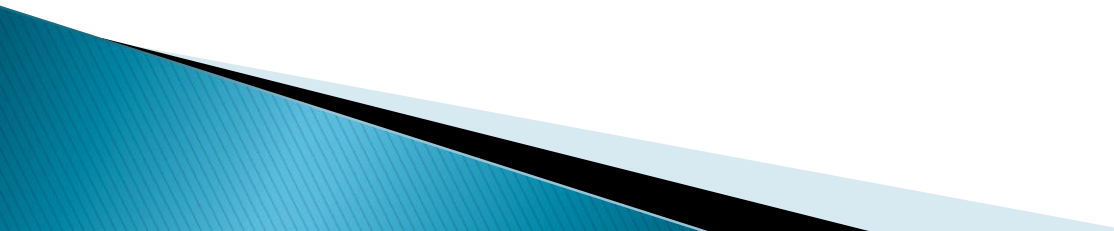
Tools of the Mind as a Case Study

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Learning and Learning Event
Understanding PreK-3rd Structures
U.S. Department of Education
U.S. Department of Health & Human
Services
Washington, DC
April 23, 2010

Continuity in what?

In

- ▶ Underlying cognitive skills, like self-regulation, as well as content
 - ▶ Instructional methods and assessments
 - ▶ Teacher knowledge of child development and developmental trajectories
- 



Tools of the Mind

- ▶ Learning leads development
- ▶ Learning is fundamentally a social act—learning involves the mind of another person
- ▶ Self-regulation is a core process in development and is learned
- ▶ Content is a vehicle for teaching underlying cognitive skills
- ▶ There are ‘leading activities’ at different ages and a set of critical underlying skills to be mastered within each



Continuity in underlying skills

Newsweek

MIND MATTERS | Wray Herbert

Is EF the New IQ?

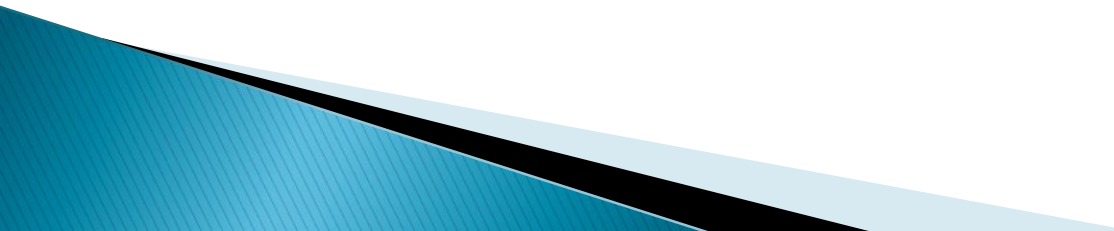
Why the ability to resist distraction, a skill scientists call "executive function," may be more important to academic success than traditional measures of intelligence.

Jun 4, 2008 / Updated: 10:27 a.m. ET Jun 4, 2008

Self-regulation predicts academic performance in first grade, over and above cognitive skills and family backgrounds

(e.g., Blair, 2002; Farran, 2010; McClelland, M. M., Piccinin, A., & Stallings, M. C 2010; Raver & Knitzer, 2002)

Components of Self-Regulation/EF

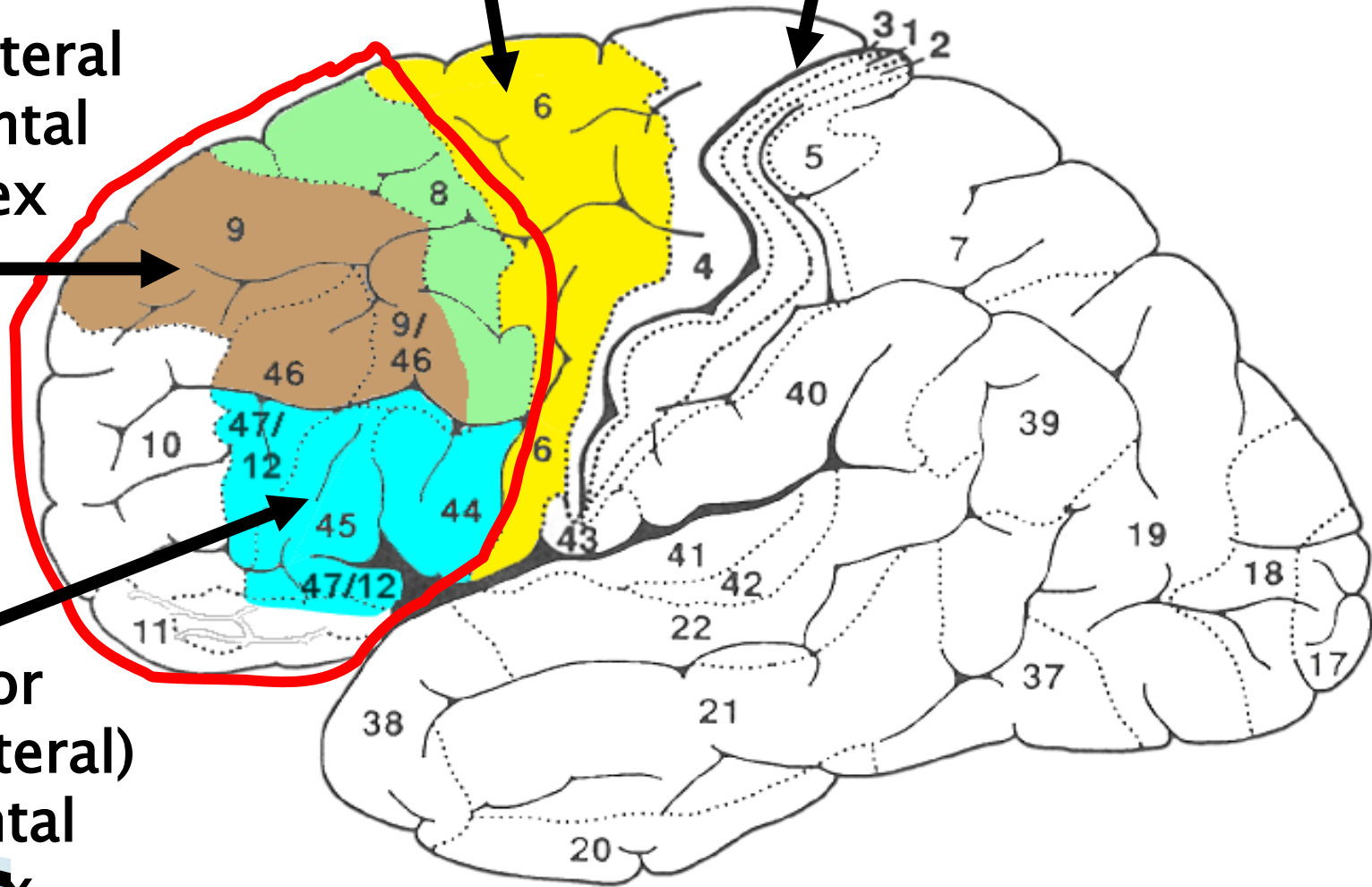
- ▶ Inhibitory, effortful or self-control
 - ▶ Working Memory
 - ▶ Cognitive Flexibility
- 

**SMA &
Premotor
Cortex**

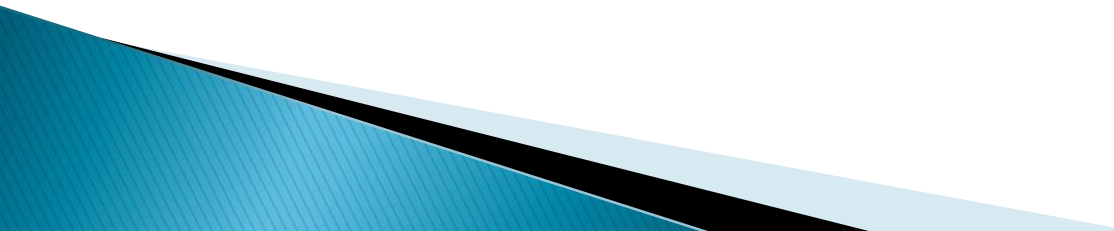
**Central
Sulcus**

**Dorsolateral
Prefrontal
Cortex**

**Inferior
(ventrolateral)
Prefrontal
Cortex**



Inhibitory, Effortful, or Self-Control

- ▶ Controlling anxiety when you make mistakes
 - ▶ Controlling your temper when you don't get your way or what you want
 - ▶ Being able to stop and think before you act
 - ▶ Acting appropriately when tempted to do otherwise
 - ▶ Paying attention despite distractions
 - ▶ Staying on task even when bored or delaying gratification
 - ▶ Stopping yourself from using the first strategy that comes to mind in favor of a second
- 

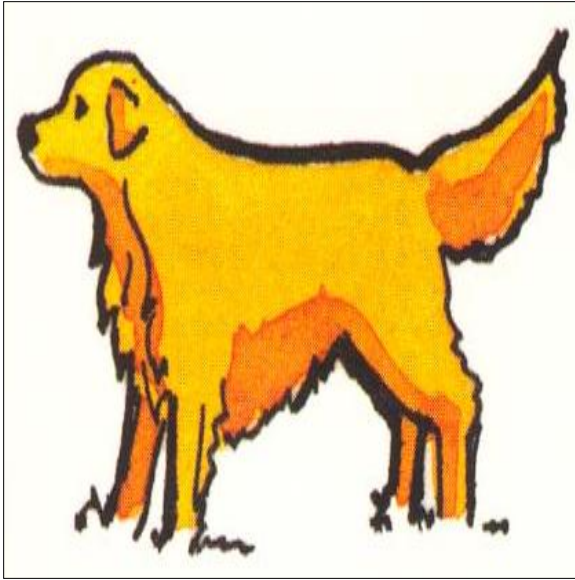
Being able to act appropriately
when tempted to do otherwise



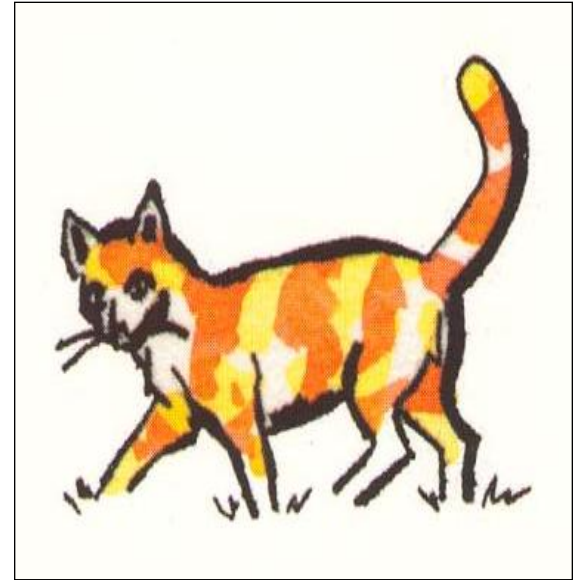
Controlling your temper when
you don't get your way or
what you want

Being able to delay gratification





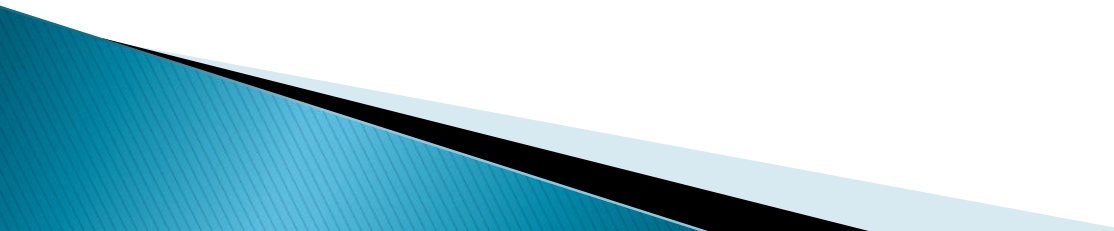
Dog



Dog

Bialystok & Martin, 2002

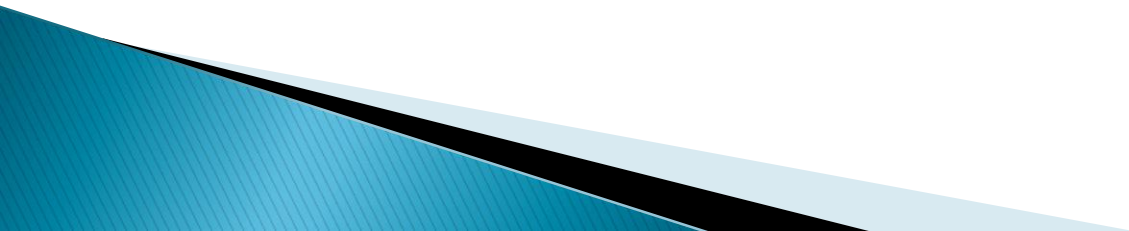
Working Memory

- ▶ Holding information in mind and being able to work with it
 - ▶ Being able to reflect on one's thinking
 - ▶ Weighing two different strategies so you consider which is the better one
 - ▶ Taking more than one perspective at a time
- 

Consider reading the following two sentences:

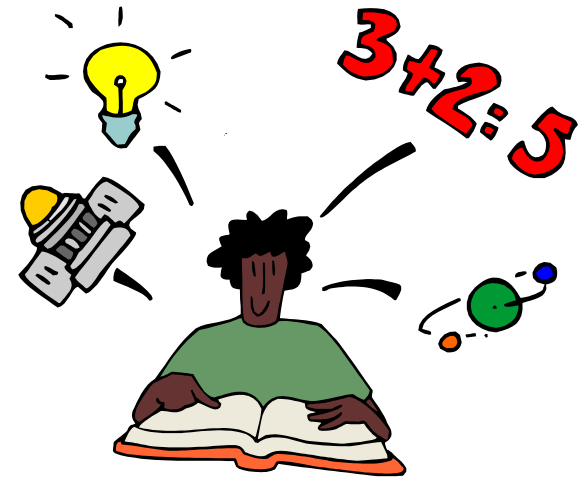
I love to read books.

I read two books before I came to class.

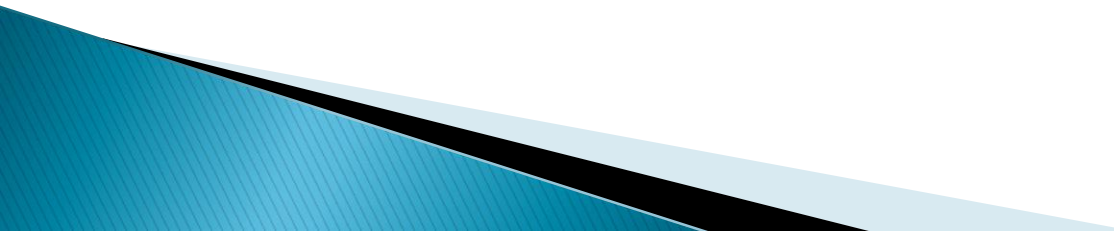


Cognitive Flexibility

- ▶ Flexibly adjusting thinking, actions, and mental effort to changing demands of the situation
- ▶ Intentionally investing more mental effort in tasks that are difficult
- ▶ Multi-tasking (given two or three assignments for homework)



Self-Regulation/EF skills are necessary when you need to be intentional, to learn something new--on-purpose--when you are not functioning on autopilot



The Development & Neural Bases of Cognitive Flexibility and Executive Function



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Our pilot evaluation of Tools with an at-risk population

100 preschoolers

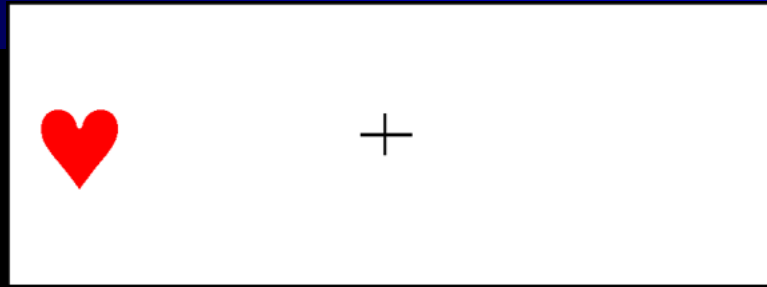
100 Kindergarteners

Children had received 0, 1, or 2 years of Tools.

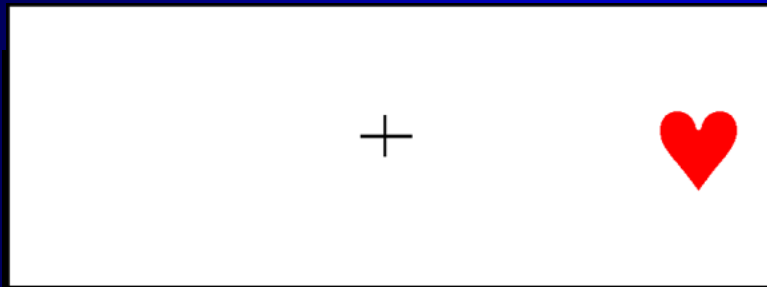
Academic outcomes were obtained independently by NIEER (Steve Barnett).



Hearts - Congruent

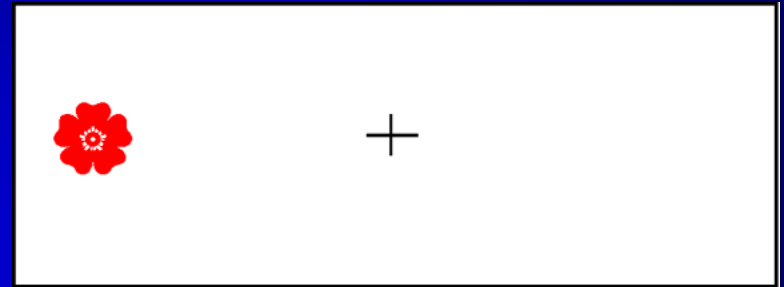


Push Left

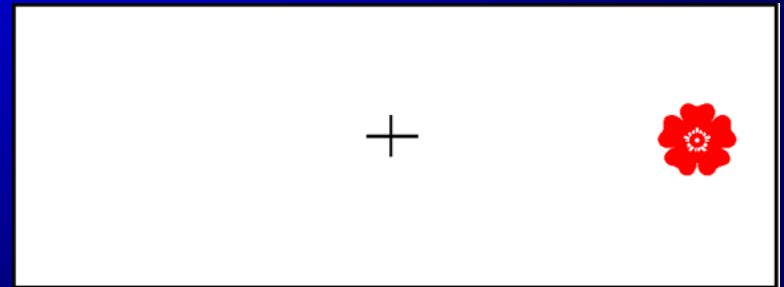


Push Right

Flowers - Incongruent



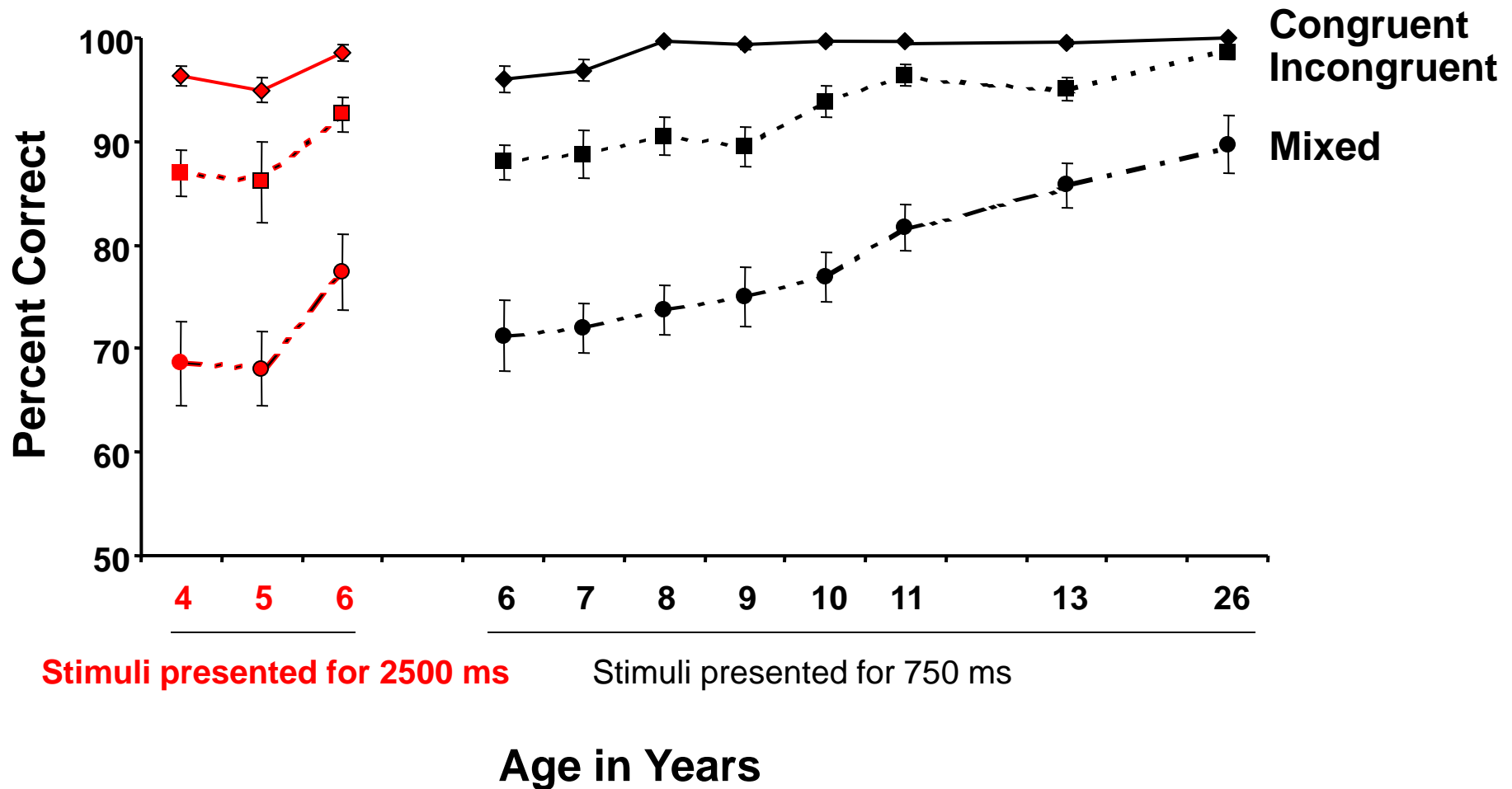
Push Right



Push Left

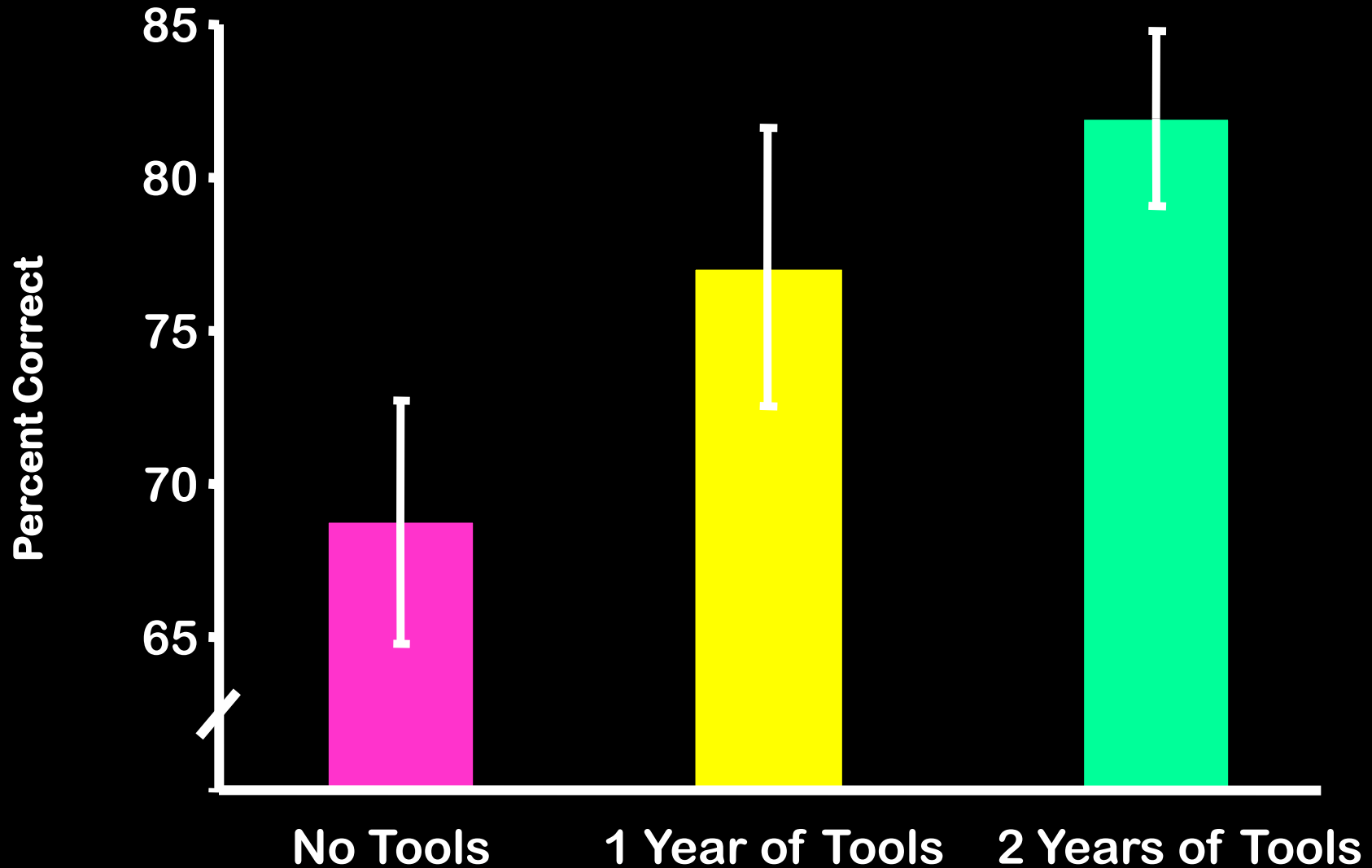
Requires holding 2 higher order rules in mind (hearts - same side; flowers- opposite side) and on incongruent trials inhibiting the prepotent tendency to respond on the same side as the stimulus.

Hearts/Flowers Conditions: Accuracy



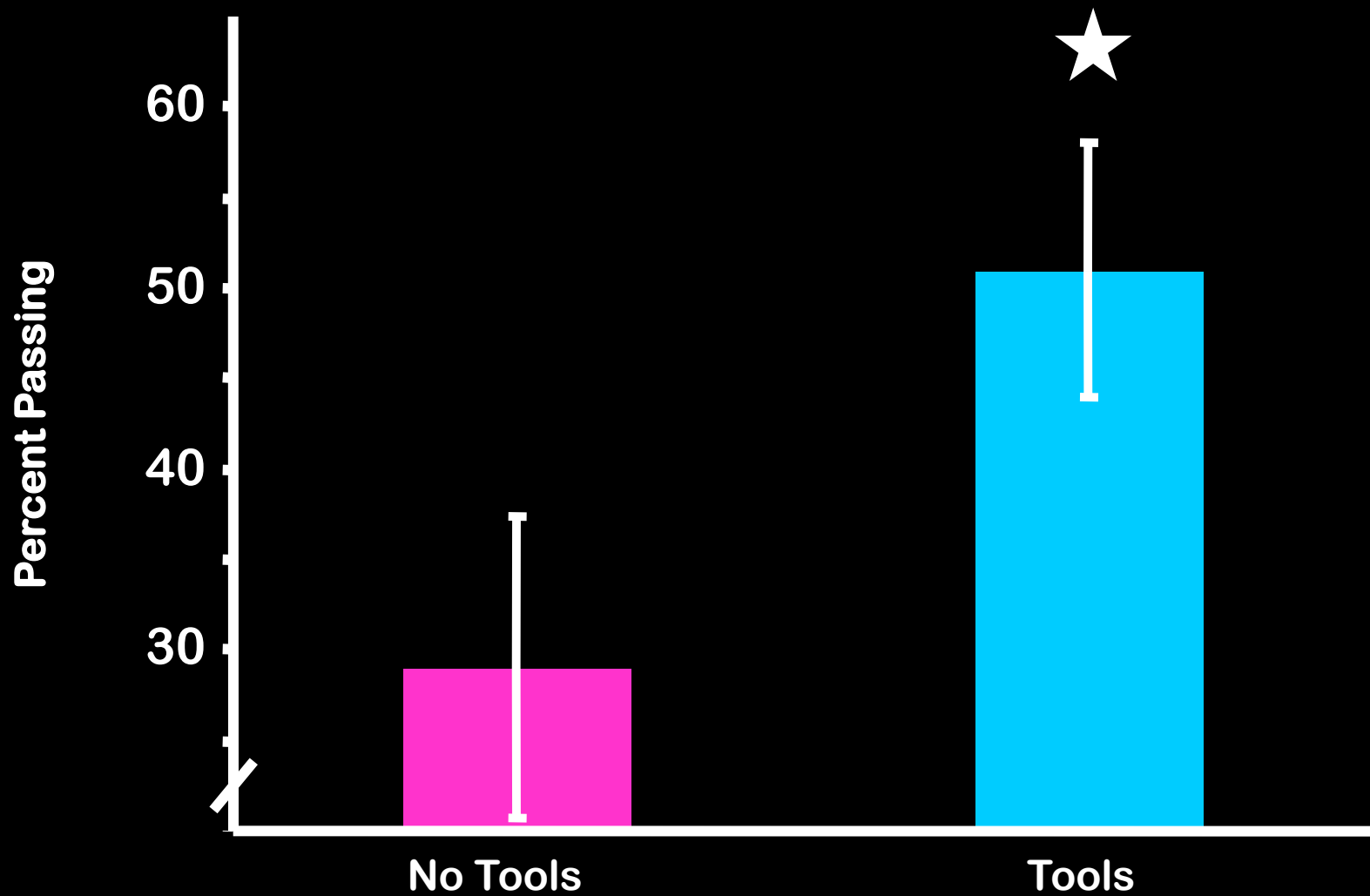
Four-year-olds would often call out the correct higher-order answer on each trial of hearts/flowers-MIXED (“same,” “opposite,” “opposite,” “same”), even as they are making many errors. It is NOT that they have forgotten the rules.

Flowers Task – Block 2 (Incongruent)
Percentage of Correct Responses
Pre-K Children



Hearts/Flowers Task - Mixed Block

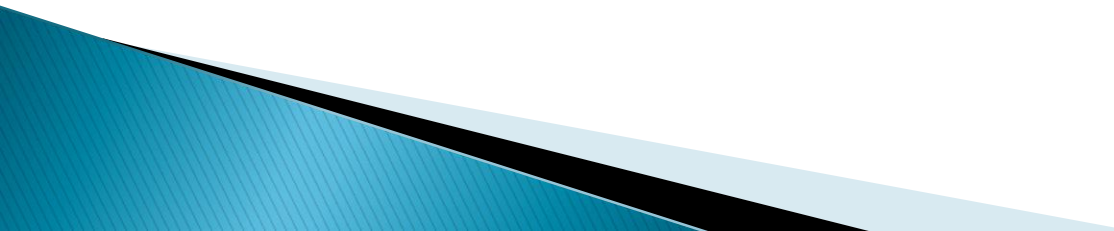
Percent of Children Who Passed Practice



Correlation of Percentage of Correct Responses on the Hearts/Flowers Task and Academic Performance Measures

| | Congruent | Incongruent | Mixed |
|--|---------------|----------------|---------------|
| SRSS (Social Skills Rating Scale) External subscale | -0.178 | -.456** | -0.177 |
| SSRS Internal subscale | -0.161 | -0.149 | 0.023 |
| PPVT (Peabody Picture Vocabulary) raw score | 0.036 | .290* | .464** |
| IDEA Oral Language proficiency raw score | 0.165 | 0.183 | .390* |
| Expressive (EOWPVT) raw score | -0.037 | .272* | .383** |
| WIPPSI raw score | 0.012 | 0.125 | 0.03 |
| WCJ (Woodcock Johnson) letter word raw score | 0.091 | 0.166 | 0.068 |
| WCJ applied problems raw score | -0.027 | .264* | .392** |
| Get Ready To Read raw score | 0.05 | .315* | .423** |
| PPVT standard score | 0.034 | .275* | .444** |
| Expressive (EOWPVT) standard score | -0.117 | 0.207 | .289* |
| Expressive standard score new (accounts for floor effect) | -0.086 | 0.242 | .329** |
| WCJ (Woodcock Johnson) letter word standard score | 0.08 | 0.167 | 0.12 |
| WCJ applied problems standard score | -0.071 | 0.218 | .359** |

Continuity in Self-Regulation

- ▶ In deliberate self-regulation practice
 - ▶ In embedding self-regulation in content activities
 - ▶ In eliminating practices that encourage unregulated behavior
 - Boredom (too easy or too hard)
 - Long large group activities
- 

Continuity in Self-Regulation




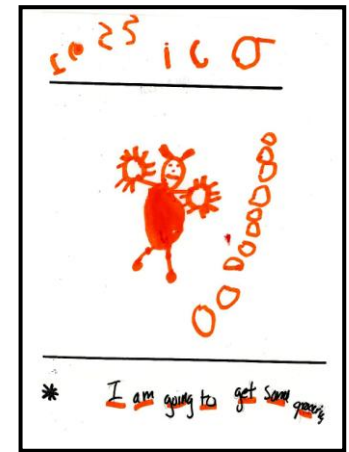
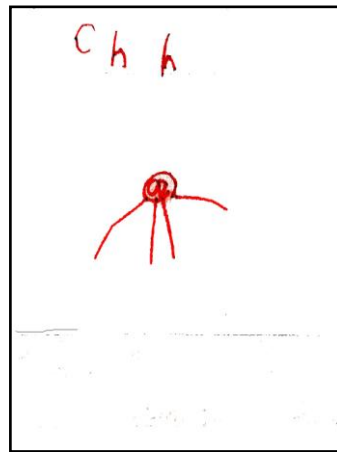
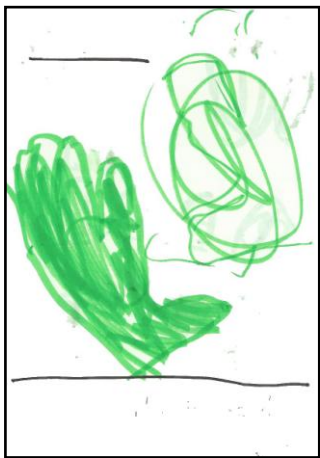
Continuity in Self-Regulation



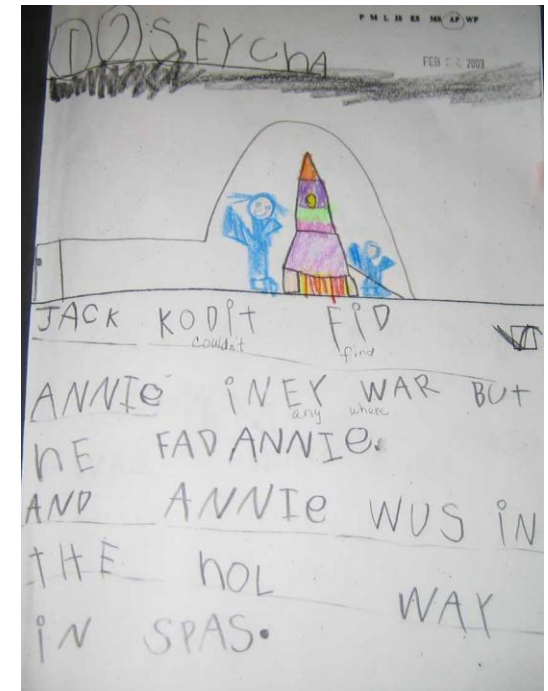
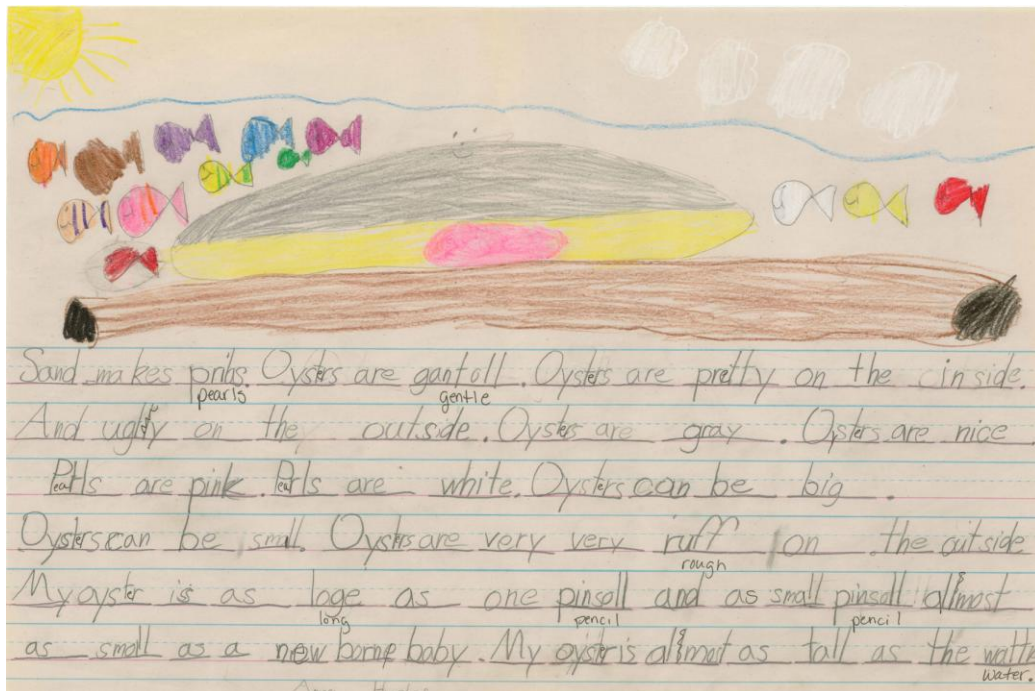
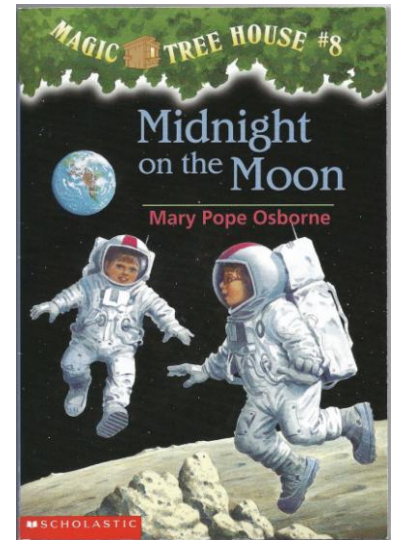
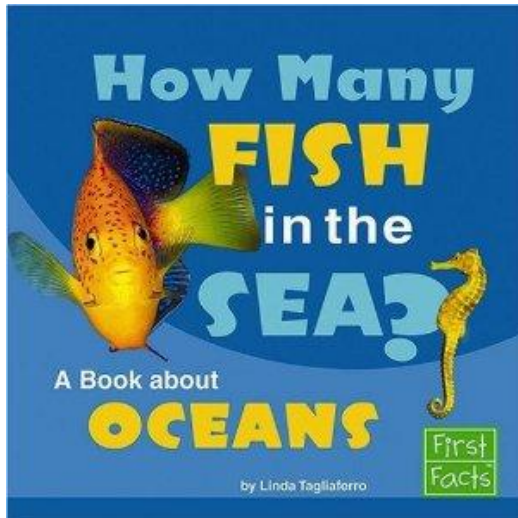
| | | |
|---|---|------------------------|
| Name: <u>Gregory</u> | | Date: <u>5/22-5/26</u> |
| Study Buddy: <u>Maxine</u> | | |
| 1 Listening Center <input checked="" type="checkbox"/> | 1 Stories and Charts <input checked="" type="checkbox"/> | |
| Alexander very doddary | Huddle PUMPT | |
| 2 Investigations <input checked="" type="checkbox"/> | 2 Penmanship Center <input checked="" type="checkbox"/> | |
| Fur | Sentences | |
| 1 Word Puzzles <input checked="" type="checkbox"/> | 1 Make a Book <input checked="" type="checkbox"/> | |
| sound Puzzles | OUR Desent HOME | |
| 2 Literacy Games <input checked="" type="checkbox"/> | 2 Sound Center <input checked="" type="checkbox"/> | |
| BOOKS | Sucr | |
| My Learning Goal is: <u>tanwars sound center</u> | | |

Continuity in Content

- ▶ Sequential
 - ▶ Systematic
 - ▶ Individualized
-
- Should follow developmental trajectories as well as content standards, taking into consideration the qualitative differences in children's abilities at different ages
 - Should have developmental breadth—there is built in support for children who need it, but enough challenge for children who are at a higher level
 - Should motivate children to become deeply engaged, to want to learn
- 



Oral Plan Picture Message Concept of Word Initial Sound Ending Sound Medial Sounds Alphabetic Principle Word Patterns



Continuity in Instruction

- ▶ Instructional practices should maximize the child's mental action taking into account the child's level of development and level of acquisition of the content



Continuity in Instruction

- ▶ The right answer should be the by-product of the right process. Instruction should help children learn the right process as well as the right answer











Weekly Learning Conferences



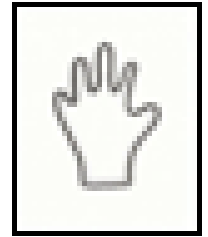
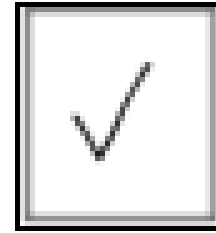
Name Gregory

Date 5/22-5/26

Study Buddy: Maxine

| | |
|---|---|
|  <input checked="" type="checkbox"/> Listening Center <u>Alexander</u> <u>very dodday</u> |  <input checked="" type="checkbox"/> Stories and Charts <u>HUDDE</u> <u>DUMPT</u> |
|  <input checked="" type="checkbox"/> 2 Investigations <u>Fur</u> |  <input checked="" type="checkbox"/> 2 Penmanship Center <u>Sentences</u> |
|  <input checked="" type="checkbox"/> Word Puzzles <u>Sound Puzzles</u> |  <input checked="" type="checkbox"/> Make a Book <u>OUR DESERT</u> <u>HOME</u> |
|  <input checked="" type="checkbox"/> 2 Literacy Games <u>BOOKS</u> |  <input checked="" type="checkbox"/> 2 Sound Center <u>Sucr</u> |
| My Learning Goal is: <u>Ten words with sound center</u> <u>(ten)</u> | |

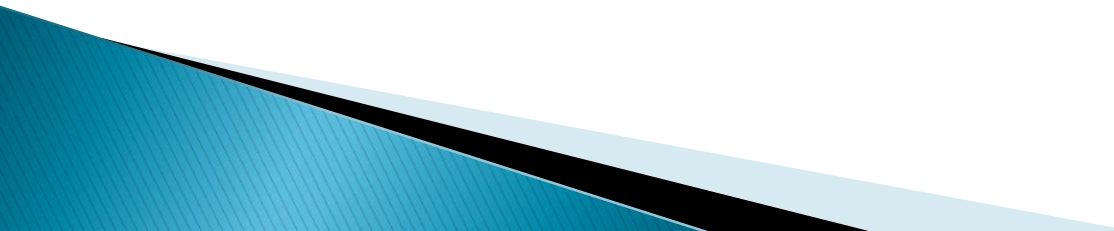
Supported Practice



Continuity in Assessment

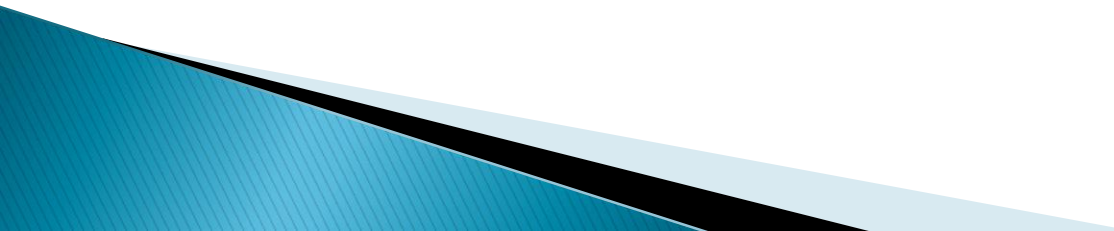
- ▶ Dynamic Assessments—designed to reveal the way children think
 - Should ask child about correct and incorrect answers
 - Should reveal if child understands errors in the process
 - Should include hints and prompts that the child might use on the next problem

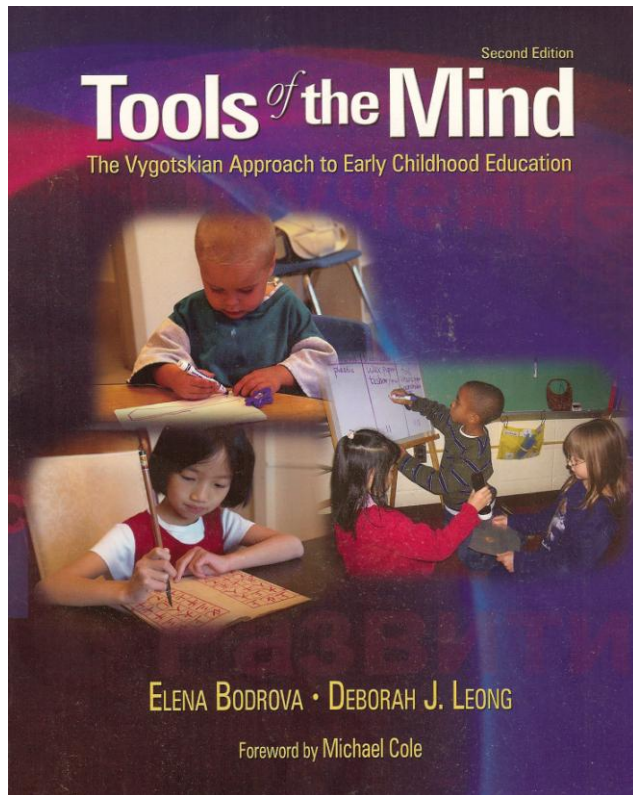
Continuity in teacher knowledge

- ▶ Teachers use developmental trajectories that span skill/concept development across the Pre-K to 3rd grade range.
 - ▶ Teachers understand how to access skills taught at lower grades and how to build on them
 - ▶ Teachers understand how teachers in later grades build upon the skills that they have taught
- 

Continuity in what?

In

- ▶ Underlying cognitive skills, like self-regulation, as well as content
 - ▶ Instructional methods and assessments
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